taking and is unpleasant to the patient, if not dangerous; and, secondly, the desire of the clinician to have some x-ray plates to look at and interpret in addition to the radiologist's report, rather than having to rely entirely on the endoscopist. One can understand the second reason, especially where the clinician is keen to be closely associated with his patient's investigations wherever possible; but I do not think it is a good reason. As for the first, I think this reflects the fact that so many endoscopies are carried out without adequate supervision by senior or well-trained clinicians, which may result in a poor diagnostic yield, unreliability, and—what is probably an even more important factor in militating against the use of endoscopy as a primary procedure—considerable discomfort and even distress to the patient. Where endoscopy services are properly organised and the examinations are carried out only by fully committed specialists or specialists in training, these objections should not apply. After all, we do not expect our registrars or ourselves to wander into an x-ray department and carry out the occasional barium meal.

I would therefore disagree with your opinion strongly and suggest that in the not-too-far-distant future an endoscopy will be widely regarded as the investigation of first choice in patients with any form of upper gastrointestinal symptom.

J S KIRKHAM

St James's Hospital,
London SW12 8HW

Non-smoking wives of heavy smokers have a higher risk of lung cancer

SIR,—Dr Takeshi Hirayama (17 January, p 183) states that there is an increased lung cancer risk in non-smoking Japanese women married to heavy smokers. If his results were to be interpreted in favour of a positive relationship between passive smoking and lung cancer, considerable implications might be drawn for health policies in general. In our opinion, his documentation and conclusions invite critical comment for several reasons.

The study is hampered by certain inadequacies. There is no definition of histological types in the lung cancers recorded in these women. For quite some time—at least since the paper of Wynder *et al*[1]—female lung cancer has been known to include a high proportion of adenocarcinomas and alveolar cell carcinomas. Moreover, Dr Hirayama's study fails to explain a lung cancer mortality rate of 18/100 000 in unmarried non-smoking women with reference to the fact that the 101 unmarried women dying of lung cancer were likely to have been recruited from smokers and non-smokers in the same proportion as their married compatriots. However, in the non-smoking wives of smokers the respective mortality rate is only 14·6/100 000. The proffered argument that unmarried women are more likely to be smokers than married ones could support the first assumption only if more than 50% of all unmarried women were actually smokers. This is highly improbable since the author admits that not more than 15% of Japanese women smoke at all.

Surprisingly, the study maintains that the non-smoking wives of heavy smokers are more likely to get lung cancer in rural than in urban parts of Japan, thereby disagreeing with the results of other studies from various countries. In Germany Ulmer[2] found that from 1971 to 1975 women living in an urban district died of bronchial carcinoma 2·19 times more often than those in a comparable rural district. None of the recent studies on passive smoking has asserted a correlation between passive smoking and the development of lung cancer[3–6] except for a paper by Trichopoulos *et al*,[7] whose small number of inappropriately selected cases appears unable to yield convincing results. One well-known effect of passive smoking is the irritation of eyes, nose, and throat which may even lead to reduced maximal pulmonary function; another is the impairment of powers of concentration felt by non-smokers dwelling in smoke-infested rooms.[8–10]

A dose-effect relationship in the development of malignancy is undisputed. Passive smokers living and working in smoke-infested rooms will take up smoke mainly through the nose (like pipe smokers), using the natural filter that smokers evade. (This explains the fact that the lung cancer rate is not raised among non-inhaling pipe smokers and cigar smokers.) The side-stream smoke, involuntarily taken up by the passive smoker, does still contain a high level of the noxious substances contained in tobacco, but they are diluted and weakened by normal room ventilation.[11] If we assume that the effect of 20 "passively smoked" cigarettes approximately equals that of one "active" (inhaled) cigarette, the carcinogenic substances diluted in this smoke would have to act at incredibly low concentrations to produce the alleged effect. In view of the dose-effect correlation this is highly improbable.

In view of so many open questions Dr Hirayama's conclusions do not appear very well founded. His paper, however, may stimulate further studies of greater statistical reliability.

E GRUNDMANN
K-M MÜLLER
K D WINTER

Wesuring, Germany

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SIR,—Dr Takeshi Hirayama's report (17 January, p 183) indicating that non-smoking Japanese wives of heavy smokers have an increased risk of lung cancer has far-reaching implications and needs to be seriously examined. In this regard the study apparently failed to consider the exposure of Japanese women to indoor air pollution from household heating and cooking equipment. Traditionally, that equipment was fuelled by wood or charcoal; in recent years many homes have converted to kerosene burning.[1] Smoke from wood fires has been suggested as a factor in lung cancer aetiology,[2] and cooking with kerosene stoves has been associated with lung cancer in women in Hong Kong.[3]

If nearly all Japanese women were exposed similarly to home pollution, this phenomenon would not present an epidemiological problem. However, there is some evidence that the more well-to-do tend to [illegible] greater separation between living and cooking quarters and to use electric heaters instead of charcoal or kerosene burners.[4] Thus women in better economic circumstances may not be exposed to the same level of pollutants as women in lower-income households.

The additional problem is that smoking habits may be related to socioeconomic status. Smoking has been shown to be related to social class in Western countries such as the United States and United Kingdom.[5–8] While similar data on smoking habits and socioeconomic status do not appear to be available for Japan, some information is available to show an inverse relationship between economic status and smoking. In the table I give averaged monthly household expenditure on tobacco by annual income extracted from the 1980 *Japan Statistical Yearbook*.[9]

Expenditure on tobacco in Japan according to income

Annual income (1000 yen)	Monthly household expenditure on tobacco (yen)
<2900	1424
2910–4900	1260
>4900	1213

It is suggested that less smoking may take place in the more well-to-do households, coupled with less exposure to soot and fumes from cooking and heating appliances. In contrast, there may be more smoking and greater pollution in less wealthy households. Thus, while Dr Hirayama may indeed have observed an important phenomenon, the reasons for the increased rates of lung cancer in the wives of smoking husbands may not lie in their exposure to tobacco smoke. Rather, the greater exposure of women from lower socioeconomic classes to the combustion products of cooking and heating fires may account for the observed increase in lung mortality. Dr Hirayama's finding of increased standardised lung cancer mortality rates in rural areas, where charcoal and kerosene heating have tended to persist, when compared to urban areas, where there is a higher proportion of "modernised" homes with electric heating, would seem to support this hypothesis.

Dr Hirayama is an experienced member of the epidemiology community and it is hoped that he will expand his investigation to include the effects of indoor pollution to which Japanese women may have been exposed.

T D STERLING

Simon Fraser University,
Burnaby, British Columbia,
Canada V5A 1S6

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